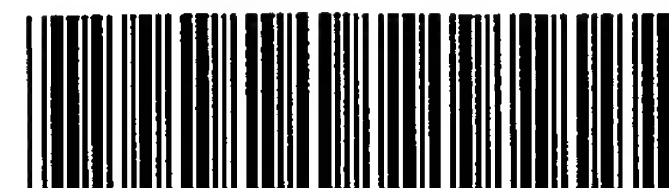


0570
07/16

ENTERED

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/067,974

DATE: 04/25/2002 P16

TIME: 12:21:53

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Output Set: N:\CRF3\04252002\J067974.raw

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5 <110> APPLICANT: Li, Lhing-Yew
6      Trei, Kelli J.
9 <120> TITLE OF INVENTION: Polynucleotide Constructs for Increased Lysine Production
13 <130> FILE REFERENCE: 1533.2640001
C--> 17 <140> CURRENT APPLICATION NUMBER: US/10/067,974
C--> 17 <141> CURRENT FILING DATE: 2002-02-08
17 <150> PRIOR APPLICATION NUMBER: 60/267,183
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23 <160> NUMBER OF SEQ ID NOS: 25
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34 <211> LENGTH: 1266
36 <212> TYPE: DNA
38 <213> ORGANISM: Corynebacterium glutamicum
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44 <221> NAME/KEY: CDS
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53 1          5          10          15
55 gaa cgc att aga aac gtc gct gaa cgg atc gtt gcc acc aag aag gct      96
56 Glu Arg Ile Arg Asn Val Ala Glu Arg Ile Val Ala Thr Lys Lys Ala
57          20          25          30
59 gga aat gat gtc gtg gtt gtc tgc tcc gca atg gga gac acc acg gat      144
60 Gly Asn Asp Val Val Val Val Cys Ser Ala Met Gly Asp Thr Thr Asp
61          35          40          45
63 gaa ctt cta gaa ctt gca gcg gca gtg aat ccc gtt ccg cca gct cgt      192
64 Glu Leu Leu Glu Leu Ala Ala Ala Val Asn Pro Val Pro Pro Ala Arg
65          50          55          60
67 gaa atg gat atg ctc ctg act gct ggt gag cgt att tct aac gct ctc      240
68 Glu Met Asp Met Leu Leu Thr Ala Gly Glu Arg Ile Ser Asn Ala Leu
69 65          70          75          80
71 gtc gcc atg gct att gag tcc ctt ggc gca gaa gct caa tct ttc act      288
72 Val Ala Met Ala Ile Glu Ser Leu Gly Ala Glu Ala Gln Ser Phe Thr
73          85          90          95
75 ggc tct cag gct ggt gtg ctc acc acc gag cgc cac gga aac gca cgc      336
76 Gly Ser Gln Ala Gly Val Leu Thr Thr Glu Arg His Gly Asn Ala Arg
77          100          105          110
79 att gtt gac gtc aca ccg ggt cgt gtg cgt gaa gca ctc gat gag ggc      384
80 Ile Val Asp Val Thr Pro Gly Arg Val Arg Glu Ala Leu Asp Glu Gly
81          115          120          125
83 aag atc tgc att gtt gct ggt ttt cag ggt gtt aat aaa gaa acc cgc      432

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/067,974

DATE: 04/25/2002

TIME: 12:21:53

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85		130					135					140					
87	gat	gtc	acc	acg	ttg	ggt	cgt	ggt	ggt	tct	gac	acc	act	gca	gtt	gcg	480
88	Asp	Val	Thr	Thr	Leu	Gly	Arg	Gly	Gly	Ser	Asp	Thr	Thr	Ala	Val	Ala	
89	145					150					155					160	
91	ttg	gca	gct	gct	ttg	aac	gct	gat	gtg	tgt	gag	att	tac	tcg	gac	gtt	528
92	Leu	Ala	Ala	Ala	Leu	Asn	Ala	Asp	Val	Cys	Glu	Ile	Tyr	Ser	Asp	Val	
93					165					170					175		
95	gac	ggt	gtg	tat	acc	gct	gac	ccg	cgc	atc	gtt	cct	aat	gca	cag	aag	576
96	Asp	Gly	Val	Tyr	Thr	Ala	Asp	Pro	Arg	Ile	Val	Pro	Asn	Ala	Gln	Lys	
97			180					185				190					
99	ctg	gaa	aag	ctc	agc	ttc	gaa	gaa	atg	ctg	gaa	ctt	gct	gct	gtt	ggc	624
100	Leu	Glu	Lys	Leu	Ser	Phe	Glu	Glu	Met	Leu	Glu	Leu	Ala	Ala	Val	Gly	
101		195					200				205						
103	tcc	aag	att	ttg	gtg	ctg	cgc	agt	gtt	gaa	tac	gct	cgt	gca	ttc	aat	672
104	Ser	Lys	Ile	Leu	Val	Leu	Arg	Ser	Val	Glu	Tyr	Ala	Arg	Ala	Phe	Asn	
105	210					215				220							
107	gtg	cca	ctt	cgc	gta	cgc	tcg	tct	tat	agt	aat	gat	ccc	ggc	act	ttg	720
108	Val	Pro	Leu	Arg	Val	Arg	Ser	Ser	Tyr	Ser	Asn	Asp	Pro	Gly	Thr	Leu	
109	225			230					235						240		
111	att	gcc	ggc	tct	atg	gag	gat	att	cct	gtg	gaa	gaa	gca	gtc	ctt	acc	768
112	Ile	Ala	Gly	Ser	Met	Glu	Asp	Ile	Pro	Val	Glu	Glu	Ala	Val	Leu	Thr	
113			245					250					255				
115	ggt	gtc	gca	acc	gac	aag	tcc	gaa	gcc	aaa	gta	acc	gtt	ctg	ggt	att	816
116	Gly	Val	Ala	Thr	Asp	Lys	Ser	Glu	Ala	Lys	Val	Thr	Val	Leu	Gly	Ile	
117			260					265					270				
119	tcc	gat	aag	cca	ggc	gag	gct	gcc	aag	gtt	ttc	cgt	gcg	ttg	gct	gat	864
120	Ser	Asp	Lys	Pro	Gly	Glu	Ala	Ala	Lys	Val	Phe	Arg	Ala	Leu	Ala	Asp	
121		275					280				285						
123	gca	gaa	atc	aac	att	gac	atg	gtt	ctg	cag	aac	gtc	tcc	tct	gtg	gaa	912
124	Ala	Glu	Ile	Asn	Ile	Asp	Met	Val	Leu	Gln	Asn	Val	Ser	Ser	Val	Glu	
125	290					295				300							
127	gac	ggc	acc	acc	gac	atc	acg	ttc	acc	tgc	cct	cgc	gct	gac	gga	cgc	960
128	Asp	Gly	Thr	Thr	Asp	Ile	Thr	Phe	Thr	Cys	Pro	Arg	Ala	Asp	Gly	Arg	
129	305			310					315						320		
131	cgt	gcg	atg	gag	atc	ttg	aag	aag	ctt	cag	gtt	cag	ggc	aac	tgg	acc	1008
132	Arg	Ala	Met	Glu	Ile	Leu	Lys	Lys	Leu	Gln	Val	Gln	Gly	Asn	Trp	Thr	
133			325						330					335			
135	aat	gtg	ctt	tac	gac	gac	cag	gtc	ggc	aaa	gtc	tcc	ctc	gtg	ggt	gct	1056
136	Asn	Val	Leu	Tyr	Asp	Asp	Gln	Val	Gly	Lys	Val	Ser	Leu	Val	Gly	Ala	
137			340					345					350				
139	ggc	atg	aag	tct	cac	cca	ggt	gtt	acc	gca	gag	ttc	atg	gaa	gct	ctg	1104
140	Gly	Met	Lys	Ser	His	Pro	Gly	Val	Thr	Ala	Glu	Phe	Met	Glu	Ala	Leu	
141		355					360				365						
143	cgc	gat	gtc	aac	gtg	aac	atc	gaa	ttg	att	tcc	atc	tct	gag	atc	cgc	1152
144	Arg	Asp	Val	Asn	Val	Asn	Ile	Glu	Leu	Ile	Ser	Ile	Ser	Glu	Ile	Arg	
145	370					375				380							
147	att	tcc	gtg	ctg	atc	cgt	gaa	gat	gat	ctg	gat	gct	gct	gca	cgt	gca	1200
148	Ile	Ser	Val	Leu	Ile	Arg	Glu	Asp	Asp	Leu	Asp	Ala	Ala	Ala	Arg	Ala	

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/067,974

DATE: 04/25/2002

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Output Set: N:\CRF3\04252002\J067974.raw

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149 385          390          395          400
151 ttg cat gag cag ttc cag ctg ggc ggc gaa gac gaa gcc gtc gtt tat      1248
152 Leu His Glu Gln Phe Gln Leu Gly Gly Glu Asp Glu Ala Val Val Tyr
153          405          410          415
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156 Ala Gly Thr Gly Arg
157          420
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162 <211> LENGTH: 421
164 <212> TYPE: PRT
166 <213> ORGANISM: Corynebacterium glutamicum
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177          20          25          30
180 Gly Asn Asp Val Val Val Val Cys Ser Ala Met Gly Asp Thr Thr Asp
181          35          40          45
184 Glu Leu Leu Glu Leu Ala Ala Ala Val Asn Pro Val Pro Pro Ala Arg
185          50          55          60
188 Glu Met Asp Met Leu Leu Thr Ala Gly Glu Arg Ile Ser Asn Ala Leu
189 65          70          75          80
192 Val Ala Met Ala Ile Glu Ser Leu Gly Ala Glu Ala Gln Ser Phe Thr
193          85          90          95
196 Gly Ser Gln Ala Gly Val Leu Thr Thr Glu Arg His Gly Asn Ala Arg
197          100          105          110
200 Ile Val Asp Val Thr Pro Gly Arg Val Arg Glu Ala Leu Asp Glu Gly
201          115          120          125
204 Lys Ile Cys Ile Val Ala Gly Phe Gln Gly Val Asn Lys Glu Thr Arg
205          130          135          140
208 Asp Val Thr Thr Leu Gly Arg Gly Gly Ser Asp Thr Thr Ala Val Ala
209 145          150          155          160
212 Leu Ala Ala Ala Leu Asn Ala Asp Val Cys Glu Ile Tyr Ser Asp Val
213          165          170          175
216 Asp Gly Val Tyr Thr Ala Asp Pro Arg Ile Val Pro Asn Ala Gln Lys
217          180          185          190
220 Leu Glu Lys Leu Ser Phe Glu Glu Met Leu Glu Leu Ala Ala Val Gly
221          195          200          205
224 Ser Lys Ile Leu Val Leu Arg Ser Val Glu Tyr Ala Arg Ala Phe Asn
225          210          215          220
228 Val Pro Leu Arg Val Arg Ser Ser Tyr Ser Asn Asp Pro Gly Thr Leu
229 225          230          235          240
232 Ile Ala Gly Ser Met Glu Asp Ile Pro Val Glu Glu Ala Val Leu Thr
233          245          250          255
236 Gly Val Ala Thr Asp Lys Ser Glu Ala Lys Val Thr Val Leu Gly Ile
237          260          265          270
240 Ser Asp Lys Pro Gly Glu Ala Ala Lys Val Phe Arg Ala Leu Ala Asp
241          275          280          285
244 Ala Glu Ile Asn Ile Asp Met Val Leu Gln Asn Val Ser Ser Val Glu

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RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/067,974

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Output Set: N:\CRF3\04252002\J067974.raw

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248	Asp Gly Thr Thr Asp Ile Thr Phe Thr Cys Pro Arg Ala Asp Gly Arg			
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252	Arg Ala Met Glu Ile Leu Lys Lys Leu Gln Val Gln Gly Asn Trp Thr			
253		325	330	335
256	Asn Val Leu Tyr Asp Asp Gln Val Gly Lys Val Ser Leu Val Gly Ala			
257		340	345	350
260	Gly Met Lys Ser His Pro Gly Val Thr Ala Glu Phe Met Glu Ala Leu			
261		355	360	365
264	Arg Asp Val Asn Val Asn Ile Glu Leu Ile Ser Ile Ser Glu Ile Arg			
265		370	375	380
268	Ile Ser Val Leu Ile Arg Glu Asp Asp Leu Asp Ala Ala Ala Arg Ala			
269	385	390	395	400
272	Leu His Glu Gln Phe Gln Leu Gly Gly Glu Asp Glu Ala Val Val Tyr			
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301	1	5	10	15
303	atg cgc acc ttt ttg gaa gag cgc aat ttc cca gct gac act gtt cgt			96
304	Met Arg Thr Phe Leu Glu Glu Arg Asn Phe Pro Ala Asp Thr Val Arg			
305		20	25	30
307	ttc ttt gct tcc ccg cgt tcc gca ggc cgt aag att gaa ttc cgt ggc			144
308	Phe Phe Ala Ser Pro Arg Ser Ala Gly Arg Lys Ile Glu Phe Arg Gly			
309		35	40	45
311	acg gaa atc gag gta gaa gac att act cag gca acc gag gag tcc ctc			192
312	Thr Glu Ile Glu Val Glu Asp Ile Thr Gln Ala Thr Glu Glu Ser Leu			
313		50	55	60
315	aag ggc atc gac gtt gcg ttg ttc tct gct gga ggc acc gct tcc aag			240
316	Lys Gly Ile Asp Val Ala Leu Phe Ser Ala Gly Gly Thr Ala Ser Lys			
317	65	70	75	80
319	cag tac gct cca ctg ttt gct gct gca ggc gcg act gtt gtg gat aac			288
320	Gln Tyr Ala Pro Leu Phe Ala Ala Ala Gly Ala Thr Val Val Asp Asn			
321		85	90	95
323	tct tct gct tgg cgc aag gac gac gag gtt cca cta atc gtc tct gag			336
324	Ser Ser Ala Trp Arg Lys Asp Asp Glu Val Pro Leu Ile Val Ser Glu			
325		100	105	110
327	gtg aac cct tcc gac aag gat tcc ctg gtc aag ggc att att gcg aat			384
328	Val Asn Pro Ser Asp Lys Asp Ser Leu Val Lys Gly Ile Ile Ala Asn			
329		115	120	125

RAW SEQUENCE LISTING

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331 cct aac tgc acc acc atg gct gca atg cca gtg ctg aag cca ctg cac      432
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333      130                      135                      140
335 gat gcc gct ggt ctt gta aag ctt cac gtt tcc tct tac cag gct gtt      480
336 Asp Ala Ala Gly Leu Val Lys Leu His Val Ser Ser Tyr Gln Ala Val
337 145                      150                      155                      160
339 tcc ggt tct ggt ctt gca ggt gtg gaa acc ttg gca aag cag gtt gct      528
340 Ser Gly Ser Gly Leu Ala Gly Val Glu Thr Leu Ala Lys Gln Val Ala
341                      165                      170                      175
343 gca gtt ggc gac cac aac gtt gag ttc gtc cat gat gga cag gct gct      576
344 Ala Val Gly Asp His Asn Val Glu Phe Val His Asp Gly Gln Ala Ala
345                      180                      185                      190
347 gac gca ggc gat gtc gga cct tac gtt tcc cca atc gct tac aac gtg      624
348 Asp Ala Gly Asp Val Gly Pro Tyr Val Ser Pro Ile Ala Tyr Asn Val
349                      195                      200                      205
351 ctg cca ttc gcc gga aac ctc gtc gat gac ggc acc ttc gaa acc gac      672
352 Leu Pro Phe Ala Gly Asn Leu Val Asp Asp Gly Thr Phe Glu Thr Asp
353      210                      215                      220
355 gaa gag cag aag ctg cgc aac gaa tcc cgc aag att ctc ggc ctc cca      720
356 Glu Glu Gln Lys Leu Arg Asn Glu Ser Arg Lys Ile Leu Gly Leu Pro
357 225                      230                      235                      240
359 gac ctc aag gtc tca ggc acc tgc gtc cgc gtg ccg gtt ttc acc ggc      768
360 Asp Leu Lys Val Ser Gly Thr Cys Val Arg Val Pro Val Phe Thr Gly
361                      245                      250                      255
363 cac acg ctg acc att cac gcc gaa ttc gac aag gca atc acc gtc gag      816
364 His Thr Leu Thr Ile His Ala Glu Phe Asp Lys Ala Ile Thr Val Glu
365                      260                      265                      270
367 cag gcg cag gag atc ttg ggt gcc gct tca ggc gtc gag ctt gtc gac      864
368 Gln Ala Gln Glu Ile Leu Gly Ala Ala Ser Gly Val Glu Leu Val Asp
369                      275                      280                      285
371 gtc cca acc cca ctt gca gct gcc ggc att gac gaa tcc ctc gtt gga      912
372 Val Pro Thr Pro Leu Ala Ala Ala Gly Ile Asp Glu Ser Leu Val Gly
373      290                      295                      300
375 cgc atc cgt cag gac tcc act gtc gac gac aac cgc ggt ctg gtt ctc      960
376 Arg Ile Arg Gln Asp Ser Thr Val Asp Asp Asn Arg Gly Leu Val Leu
377 305                      310                      315                      320
379 gtc gta tct ggc gat aac ctt cgc aag ggc gca gca ctg aac acc att      1008
380 Val Val Ser Gly Asp Asn Leu Arg Lys Gly Ala Ala Leu Asn Thr Ile
381                      325                      330                      335
383 cag att gct gag ctg ctg gtt aag taa      1035
384 Gln Ile Ala Glu Leu Leu Val Lys
385      340
388 <210> SEQ ID NO: 4
390 <211> LENGTH: 344
392 <212> TYPE: PRT
394 <213> ORGANISM: Corynebacterium glutamicum
398 <400> SEQUENCE: 4
400 Met Thr Thr Ile Ala Val Val Gly Ala Thr Gly Gln Val Gly Gln Val
401 1                      5                      10                      15

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RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/067,974

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Input Set : A:\seqlist-15332640001 ascii
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Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:16; Xaa Pos. 40,317,345,380

Invalid <213> Response:

Use of "Artificial" only as "<213> Organism" response is incomplete, per 1.823(b) of New Sequence Rules. Valid response is Artificial Sequence.

Seq#:17,18,19,20,21,22,23,24,25

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/067,974

DATE: 04/25/2002

TIME: 12:21:54

Input Set : A:\seqlist-15332640001 ascii

Output Set: N:\CRF3\04252002\J067974.raw

L:17 M:270 C: Current Application Number differs, Replaced Current Application No
L:17 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:1472 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:32
L:1540 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:304
L:1548 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:336
L:1556 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:368
L:1580 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:17
L:1598 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:18
L:1616 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:19
L:1634 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:20
L:1652 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:21
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